

Production of Nuclei on the Proton Dripline with MARS at Texas A&M University

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Proton-rich nuclei at the proton dripline have been produced at beam energies of $>77\text{MeV/u}$ at facilities such as GANIL and NSCL at Michigan State University. At Texas A&M, our goal is to produce these proton-rich nuclei at energies around 40 MeV/u with beam from the K500 cyclotron, and separate these nuclei using the Momentum Achromat Recoil Spectrometer (MARS). We used a spectrometer simulator, LISE++, to devise an experiment with a ^{40}Ca beam at 40 MeV/u on Be, Al, and Ni targets to determine how to optimally produce $^{35,36}\text{Ca}$. We tuned MARS to the parameters LISE++ predicted to see how much of these exotic nuclei we could produce in experiment. The products were detected with a ΔE vs. E Si telescope to determine the yield of each isotope. It was concluded that at this energy, the Ni target had the highest production rate for the nuclei close to the proton dripline. The comparison between the experimental production rates and the production rates LISE++ predicted will be presented.